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INTERIM
AIR MONITORING REPORT
ON
THANE DEVELOPMENTS LIMITED,
TOWN OF GEORGINA
(OPERATING AS ALUMINUM
DROSS RECYCLING LIMITED)

APRIL 1987

Ontario
Ministry
of the
Environment

G. MIERZYNSKI, Director
Central Region

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(OPERATING AS ALUMINUM DROSS RECYCLING LIMITED)

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ENVIRONMENTAL QUALITY ASSESSMENT UNIT
CENTRAL REGION
MINISTRY OF THE ENVIRONMENT
TORONTO, ONTARIO

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INTRODUCTION

Since December 1985, the Ministry of the Environment has operated an air monitoring network around Thane Developments Limited in the Town of Georgina. The purpose of the survey is to monitor air emissions from the secondary aluminum smelter.

THANE DEVELOPMENTS LIMITED

The company is operating as Aluminum Dross Recycling Limited, located in Lot 2, Concession 4, Town of Georgina. The plant recycles aluminum dross and other solid industrial scraps. The dross and scraps are melted in a rotary furnace, with salt being added sometimes as a flux. Aluminum ingots are being produced.

Air emissions from the smelting process are vented through a baghouse before being released into the atmosphere. Emissions may include small quantity of metal oxide dusts. Chlorination of molten aluminum in secondary refinery furnaces produces aluminum chloride fume which creates a high-opacity white cloud when it comes in contact with moist air.

AIR MONITORING STATIONS

As seen in Figure 1, three air monitoring stations have been installed. Each site is equipped with hi-vols (high-volume samplers), dustfall, and fluoride candle. All three sampling techniques require laboratory analysis.

Station 48140 (Brown property) is located just south of the plant on 5th Concession, approximately 1 kilometer north of Ravenshoe Side Road.

Station 48141 (Ingham property) is adjacent to the north side of the smelter. Station 48142 (Calderaro property) is the furthest away, approximately 1.5 kilometers west of the plant. It is located off Woodbine Avenue.

HI-VOL DATA

Hi-vols are samplers equipped with pumps similar to those in vacuum cleaners. A large volume of air is drawn through pre-weighed filters which capture the particulate matter over a 24-hour sampling period.

Since aluminum is of particular interest, a special filter (Whatman) has to be used instead of the routine glass fibre type. One of the disadvantages of the Whatman filter is that it is hydroscopic (absorbs moisture); therefore no TSP (Total Suspended Particulates) can be determined. However, a wide range of parameters is being analyzed:

	PARAMETERS	24-HR CRITERIA OR STANDARDS*
Al	Aluminum	None
Ca	Calcium	None
Cd	Cadmium	2 ug/m^3
Cl	Chloride	None
Co	Cobalt	None
Cr	Chromium	10 ug/m^3*
Cu	Copper	50 ug/m^3*
Fe	Iron	4 ug/m^3*
F	Fluorides	1.72 ug/m^3 (Apr.15-Oct.15) 3.44 ug/m^3 (Oct.16-Apr.14)
Mg	Magnesium	None
Mn	Manganese	50 ug/m^3*
Ni	Nickel	2 ug/m^3
NH3	Ammonium	None
NO3	Nitrates	None
Pb	Lead	5 ug/m^3
PO4	Phosphates	None
Si	Silicon	None
SO4	Sulphates	None
V	Vanadium	2 ug/m^3
Zn	Zinc	100 ug/m^3*

All the available hi-vol data for stations 48140, 48141, and 48142 are presented in Table 1, 2, and 3, respectively. All unavailable data are left blank. Each table has summary statistics at the bottom to complement each data set. The pollutant concentrations are expressed in microgram per cubic metre (ug/m^3).

The overall concentrations for all the parameters being measured are low. The average aluminum levels for the three sites were 0.84 ug/m^3(48140), 0.24 ug/m^3(48141), and 0.23ug/m^3(48142). The maximum was 7 ug/m^3 detected at station 48140 on Feb.21/86. With a few exceptions, all aluminum levels were below 1 ug/m^3 (92%).

Since aluminum chloride is responsible for the formation of white fume cloud, chloride levels are also of interest. They averaged 1.46 ug/m^3(48140), 0.59 ug/m^3(48141), and 0.32 ug/m^3(48142). The maximum was 15.5 ug/m^3, detected at station 48140 on Feb.21/86. There are no criteria or standards for aluminum and chloride in air.

Lead levels were extremely low for all three sites and were well below the 24-hour criterion of 5 ug/m^3. Chromium, copper, iron, manganese, and zinc all displayed concentrations below Ministry standards.

Cadmium, cobalt, fluoride, nickel, phosphates, and vanadium were in most cases below their detection limits. The remaining parameters, namely calcium, magnesium, ammonium, silicon, and sulphates, do not have any criteria or standards. However, their concentrations can be considered low.

The average concentrations of all pollutants for all three stations are summarized in Table 4. With the exception of aluminum, calcium, and chloride, the levels of contaminants detected were similar for all three sites, including the control station (48142).

For those parameters that are routinely analyzed, namely cadmium, chromium, copper, iron, manganese, nickel, lead, nitrates, and sulphates, the concentrations around the plant were quite a bit lower than those in other industrial areas in urban centres like Toronto.

DUSTFALL AND FLUORIDE CANDLE DATA

Dustfall jars collect larger particles that settle out of the air due to the influence of gravity. Fluoride candles are exposed to determine fluoridation rates. Both dustfall and fluoride candles are collected on a monthly basis.

All the available dustfall and fluoride candle data for stations 48140, 48141, and 48142 are presented in Table 5, 6, and 7, respectively. Total dustfall levels for all three stations were below the 30-day criterion of 7 gm/sq.m/30 days. Lead in dustfall concentrations were well within the guideline of 0.1 gm/sq.m/30 days.

There are no criteria or standards for the remaining metals in dustfall, but the quantities detected were small. In particular, cadmium, cobalt, chromium, molybdenum, nickel, and vanadium in dustfall were mostly below detection limits. Aluminum in dustfall concentrations ranged from 0.004 to 0.086 gm/sq.m/30 days.

Fluoridation rates for all three locations were below the desirable ambient air quality criteria of 40 ug/100cm^2/30 days (Apr.15-Oct.15) and 80 ug/100cm^2/30 days (Oct.16-Apr.14).

In summary, all three sites displayed similar dustfall levels and fluoridation rates, including the furthest station (48142-Calderaro). Furthermore, these levels detected around the smelter were comparable or lower than those in urban and sub-urban areas in Toronto.

CONCLUSIONS

The overall concentrations of all parameters as measured by hi-vols, dustfalls, and fluoride candles were low. The two stations close to the plant displayed similar contaminant levels as those at the control site with the exception of aluminum, calcium, and chloride. It was likely due to the influence of the prevailing wind direction and the effects of topography.

Aluminum, which is of particular interest, showed rather low concentrations. There is no criteria or standard for aluminum in air.

As for metals that are routinely analyzed, such as cadmium, chromium, copper, iron, manganese, nickel, and lead, the levels detected around the smelter were a lot lower than those in other industrial areas in Toronto.

In view of the low concentration of pollutants being measured, it is recommended that the sampling frequency be reduced to every 6 days. In order to decrease the laboratory workload and cost, the insignificant parameters should be deleted from analysis.

There will be an updated version of this report when more data becomes available.

FIGURE 1 Location of air monitoring stations around Aluminum Dross Recycling Limited (Thane Developments Limited)

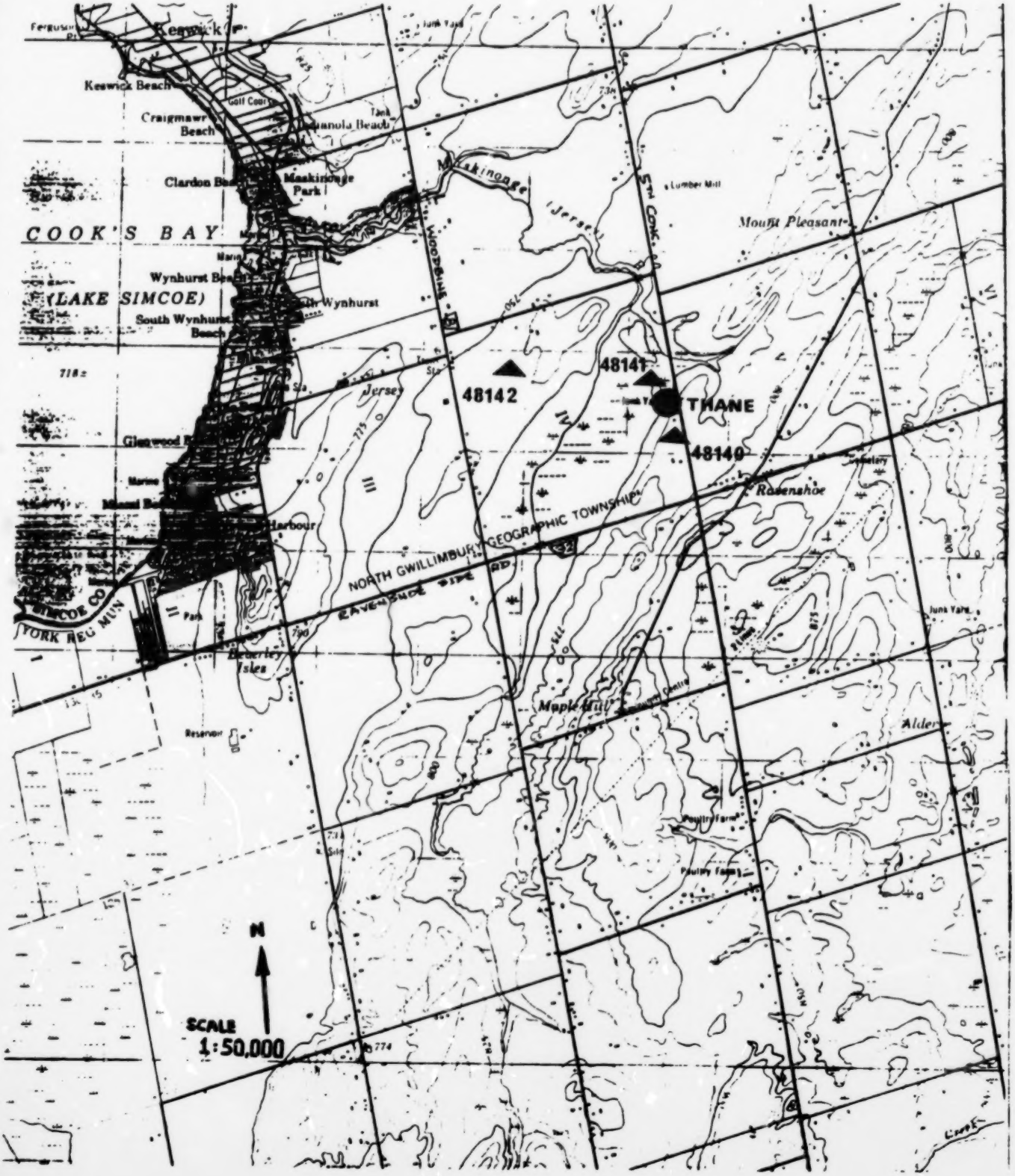

TABLE 1 HI-VOL DATA FOR STATION NO. 48140 (BROWN)

Date	Al	Ca	Cd	Cl	Co	Cr	Cu	Fe	F
851220	0.160	0.700	0.001	1.00	0.004<	0.007	0.140	0.220	0.01 <W
860111	0.610	0.520	0.001<	0.30	0.004<	0.005	0.021	0.800	0.01 <W
860114	2.000	2.500	0.001	3.00	0.004<	0.006	0.210	0.320	0.01
860117	0.260	0.340	0.001	0.80	0.004<	0.007	0.020	0.390	0.01 <W
860119	0.092	0.110	0.001	0.20	0.004<	0.014	0.150	0.180	0.01 <W
860122	0.600	0.160	0.001	4.30	0.004<	0.003	0.092	0.200	0.01 <W
860124	0.960	20.000	0.001	0.90	0.004<	0.004	0.100	0.730	0.01 <W
860127	2.700	0.280	0.002	9.00	0.004<	0.011	0.140	0.480	0.02
860131	0.280	1.500	0.001	0.90	0.004<	0.006	0.076	0.310	0.01 <W
860203	0.040	0.190	0.004<	0.06	0.004<	0.001<	0.021	0.030	0.01 <W
860204	0.088	0.001<W	0.001<W	0.46	0.002	0.001<	0.037	0.018	0.01 <W
860207	0.100	0.760	0.001	0.58	0.001<W	0.002	0.018	0.150	0.01 <W
860211	0.150	3.500	0.001<W	1.40	0.002	0.001<	0.100	0.130	0.01 <W
860212	0.220	4.000	0.001<W	0.35	0.001<W	0.005	0.045	0.140	0.01 <W
860213	0.190	4.100	0.001<W	0.26	0.001<W	0.004	0.060	0.140	0.01 <W
860214	0.190	6.800	0.001<W	0.32	0.001	0.007	0.051	0.220	0.01 <W
860217	0.120	0.540	0.001	0.06	0.003	0.009	0.051	0.170	0.01 <W
860218	0.074	0.250	0.001<W	0.06	0.001	0.004	0.120	0.076	0.01 <W
860220	0.580	0.001<W	0.001<W	0.93	0.001<W	0.004	0.029	0.055	0.01 <W
860221	7.000	0.001<W	0.001	15.50	0.001	0.008	0.450	0.490	0.02
860225	2.900		0.001	3.40	0.002<	0.003	0.270	1.700	0.01 <W
860226	5.900		0.001	8.00	0.002<	0.005	0.420	0.440	0.03
860227	0.920		0.001	1.10	0.002<	0.001	0.077	0.180	0.01 <W
860228	0.190		0.001	1.70	0.002<	0.001<	0.041	0.330	0.01 <W
860307	2.000		0.002	1.00	0.002<	0.002	0.130	0.960	0.01 <W
860308	0.370		0.002	1.60	0.002<	0.002	0.056	0.180	0.01 <W
860310	0.230		0.001	0.90	0.002<	0.001	0.044	0.230	0.01 <W
860311	0.680		0.001	0.90	0.002<	0.001	0.099	0.110	0.01 <W
860317	0.310	2.910	0.001<W	0.70	0.001<W	0.001	0.099	0.300	0.0007
860318	1.300	0.670	0.001	0.60	0.001	0.003	0.092	0.270	
860319	0.330	1.400	0.001	0.60	0.001	0.001<	0.072	0.220	
860320	2.400	0.700	0.001<W	1.70	0.001	0.004	0.094	0.240	
860321	0.610	2.760	0.001<W	0.70	0.001<W	0.001	0.030	0.230	
860324	0.970	1.960	0.001	1.20	0.002	0.001	0.079	0.370	0.001
860325	0.760	1.750	0.001<W	0.70	0.001	0.002	0.030	0.550	0.001
860327	0.760	1.200	0.001<W	0.60	0.001	0.001<	0.075	0.380	
860328	0.150	0.140	0.001<W	0.30	0.001	0.001<	0.077	0.033	
860403	3.550	7.920	0.001<W	1.30	0.002	0.001<	0.072	0.210	0.0005
860404	0.390	1.100	0.001<W	0.60	0.001<W	0.001<	0.090	0.110	
860407	0.008	0.035	0.001<W	0.20	0.001	0.001<	0.001<W	0.004<	
860408	0.100	0.160	0.001<W	0.30	0.001<W	0.001<	0.044	0.020	
860521	0.037	1.840	0.001<W	0.00<W	0.004<	0.004<	0.140	0.220	0.01 <W
860522	0.013	0.204	0.001	0.00<W	0.004<	0.004<	0.006	0.020	0.00 <W
860523	0.022	0.695	0.001	0.29	0.004<	0.010	0.002<	0.004<	0.00 <W
860526	0.074	2.147	0.001	0.00<W	0.004<	0.010	0.200	0.150	0.01 <W
860527	0.179	2.095	0.001<W	0.29	0.004<	0.004<	0.130	0.470	0.01 <W
860528	0.451	3.731	0.001<W	0.29	0.004<	0.004<	0.089	0.240	0.01
860530	0.676	4.457	0.001<W	1.70	0.004<	0.004<	0.210	0.570	0.01
860531	0.188	1.053	0.001<W	0.29	0.004<	0.004<	0.005	0.110	0.01 <W
860609	1.894	1.447	0.001<W	2.30	0.004<	0.004<	0.250	0.290	0.03
MAXIMUM	7.000	20.000	0.002	15.50	0.003	0.014	0.450	1.700	0.03
ARITH MEAN	0.639	2.076<A	0.001<A	1.46<A	0.001<A	0.005	0.100<A	0.298	0.01 <A
GEOM MEAN	0.332	0.656<A							
MINIMUM	0.008	0.001	0.001	0.00	0.001	0.001	0.001	0.018	0.00
STD DEV (GEOM *)	1.356	3.317<A							
# SAMP IN STATISTICS	51	43	49	51	24	32	50	49	41
# SAMP (EXCLUDED)			3		52	37	1	3	

Legend:

Al=Aluminum
Ca=Calcium
Cd=Cadmium
Cl=Chloride
Co=Cobalt
Cr=Chromium
Cu=Copper
Fe=Iron
F=Fluoride

Units: ug/m^3

TABLE 1 (CONT'D) HI-VOL DATA FOR STATION NO. 48140 (BROWN)

Date	Mg	Mn	Ni	NH_3	NO_3	Pb	PO_4	Si	SO_4	V	Zn
851220	0.095	0.011	0.006	3.0	8.8	0.073	0.1<W	0.762	4.6	0.009<	0.060
860111	0.220	0.029	0.005	1.4	4.1	0.029	0.1<W	3.940	2.3	0.009<	0.050
860114	0.250	0.015	0.011	0.5	0.6	0.037	0.0<W	1.057	1.7	0.009<	0.140
860117	0.110	0.021	0.005<	5.7	13.0	0.058	0.1<W	1.210	8.0	0.009<	0.110
860119	0.045	0.009	0.007	4.3	8.0	0.031	0.1<W	0.425	7.1	0.009<	0.042
860122	0.091	0.012	0.005<	2.8	2.8	0.013	0.0<W	0.729	3.7	0.009<	0.067
860124	0.420	0.032	0.005<	0.2	1.7	0.015	0.0<W	3.765	2.0	0.009<	0.059
860127	0.350	0.021	0.005	1.0	1.1	0.041	0.0<W	1.518	2.0	0.009<	0.160
860131	0.150	0.015	0.005<	1.8	5.3	0.032	0.0<W	1.456	3.3	0.009<	0.049
860203	0.020	0.005<	0.005<	0.5	1.5	0.005<	0.0<W	0.079	0.9	0.009<	0.008
860204	0.001<W	0.002	0.001	0.1 <W	2.1	0.015	0.0<W	0.100	1.4	0.001<	0.012
860207	0.032	0.013	0.001<W	0.1 <W	0.9	0.026	0.0<W	0.700	1.0	0.004	0.025
860211	0.016	0.008	0.001	0.1 <W	1.6	0.025	0.0<W	1.700	2.1	0.003	0.017
860212	0.027	0.010	0.002	0.1 <W	1.5	0.041	0.0<W	0.900	2.4	0.002	0.020
860213	0.035	0.007	0.001	0.1 <W	3.6	0.020	0.0<W	0.600	3.6	0.001<	0.013
860214	0.072	0.010	0.001<W	0.1 <W	1.0	0.021	0.0<W	0.600	1.2	0.005	0.008
860217	0.011	0.010	0.001<W	0.1 <W	5.6	0.035	0.0<W	0.200	9.7	0.002	0.048
860218	0.001<W	0.005	0.002	0.1 <W	3.8	0.016	0.0<W	0.400	7.7	0.002	0.023
860220	0.001<W	0.004	0.003	0.1 <W	0.6	0.010	0.0<W	0.100	0.4	0.010	0.035
860221	0.290	0.034	0.012	0.1 <W	5.2	0.078	0.0<W	0.700	6.8	0.010	0.430
860225	1.200	0.081	0.006	0.1 <W	1.4	0.032	0.1<W	8.800	2.3	0.003	0.120
860226	0.380	0.028	0.010	0.1 <W	0.9	0.049	0.1<W	1.700	4.3	0.002	0.260
860227	0.150	0.008	0.004	0.1 <W	0.4	0.012	0.0<W	0.900	1.3	0.001	0.030
860228	0.079	0.014	0.003<	0.1 <W	0.7	0.026	0.0<W	0.600	1.5	0.001	0.009
860307	0.430	0.027	0.008	0.1 <W	0.7	0.021	0.0<W	4.200	2.9	0.002	0.090
860308	0.190	0.009	0.008	0.1 <W	2.2	0.022	0.1<W	0.900	3.6	0.003	0.029
860310	0.078	0.015	0.003<	0.1 <W	5.3	0.064	0.1<W	1.000	5.5	0.003	0.072
860311	0.094	0.007	0.005	0.1 <W	1.7	0.028	0.0<W	0.600	4.8	0.001	0.041
860317	0.013	0.015	0.003	0.188	2.8	0.036	0.1<W	1.400	5.5	0.001<	0.029
860318	0.160	0.013	0.001	0.185	3.2	0.026	0.1<W	1.000	8.0	0.006	0.081
860319	0.110	0.012	0.001<W	0.476	9.2	0.038	0.1<W	1.100	10.1	0.005	0.092
860320	0.250	0.014	0.003	0.066	0.5	0.016	0.1<W	1.200	2.6	0.001<	0.080
860321	0.030	0.013	0.001	0.123	2.0	0.012	0.1<W	1.300	3.5	0.001<	0.031
860324	0.014	0.014	0.001<W	0.076	1.0	0.019	0.1<W	1.400	2.4	0.001<	0.027
860325	0.021	0.025	0.002	0.354	1.6	0.031	0.1<W	2.400	3.7	0.001<	0.063
860327	0.210	0.017	0.001<W	0.254	5.9	0.028	0.1<W	2.500	6.1	0.001<	0.058
860328	0.033	0.004	0.001<W	0.148	2.2	0.019	0.1<W	0.300	3.8	0.022	0.016
860403	0.001<W	0.011	0.001<W	0.041	0.5	0.009	0.1<W	1.200	0.9	0.001<	0.019
860404	0.057	0.010	0.001<W	0.204	5.5	0.010	0.1<W	0.600	3.7	0.001<	0.020
860407	0.001	0.001<W	0.001<W	0.001	0.0<W	0.001<W	0.1<W	0.100<	0.6	0.001<	0.010
860408	0.033	0.001	0.001<W	0.116	1.7	0.008	0.1<W	0.400	3.2	0.018	0.004
860521	0.126	0.010	0.004<		2.9	0.040		0.400	3.8	0.020<	0.039
860522	0.012	0.004<	0.004		0.0<W	0.005<		0.100<	0.3	0.080<	0.010
860523	0.010	0.004<	0.004<		0.0<W	0.005<		0.100<	0.0<W	0.080<	0.008
860526	0.088	0.008	0.004<		0.9	0.040		0.900	1.5	0.080<	0.019
860527	0.194	0.020	0.004<		4.1	0.050		1.600	5.0	0.080<	0.067
860528	0.165	0.010	0.004<		0.3	0.020		0.700	1.7	0.080<	0.057
860530	0.392	0.020	0.004<		1.5	0.030		2.500	2.9	0.080<	0.075
860531	0.100	0.004<	0.004<		0.6	0.005<		0.700	0.6	0.080<	0.020
860609	0.223	0.010	0.004<		0.3	0.020		0.800	1.2	0.080<	0.160
MAXIMUM	1.200	0.081	0.012	5.7	13.0	0.078	0.1	8.800	10.1	0.022	0.430
ARITH MEAN	0.143<A	0.015<A	0.003<A	0.6 <A	2.6<A	0.029<A	0.1<A	1.288	3.3<A	0.005	0.060
GEOM MEAN	0.051<A			0.2 <A							0.037
MINIMUM	0.001	0.001	0.001	0.001	0.0	0.001	0.0	0.079	0.0	0.001	0.006
STD DEV (GEOM *)	3.201<A			1.2 <A							0.072
# SAMP IN STATISTICS	51	47	36	42	51	47	42	48	51	20	51
# SAMP (EXCLUDED)		7	26			7		5		60	

Legend:
Mg=Magnesium
Mn=Manganese
Ni=Nickel
NH_3=Ammonium
Pb=Lead
PO_4=Phosphates
Si=Silicon
SO_4=Sulphates
V=Vanadium
Zn=Zinc

Units: ug/m^3

TABLE 2 HI-VOL DATA FOR STATION NO. 48141 (INGHAM)

Date	Al	Ca	Cd	Cl	Co	Cr	Cu	Fe	F
851220	0.040	0.220	0.004<	0.15	0.004<	0.007	0.047	0.090	0.01 <W
860111	0.260	0.290	0.001<	0.50	0.004<	0.010	0.040	0.310	0.01 <W
860115	0.250	4.100	0.001	1.40	0.004<	0.011	0.041	0.290	0.01 <W
860117	0.190	0.210	0.001	1.00	0.004<	0.002	0.018	0.280	0.01 <W
860119	0.070	0.073	0.001	0.10	0.004<	0.008	0.062	0.140	0.01 <W
860122	0.140	0.360	0.001<	0.70	0.004<	0.001<	0.029	0.150	0.01 <W
860124	0.260	2.600	0.001<	0.30	0.004<	0.007	0.011	0.180	0.01 <W
860127	0.280	0.340	0.001<	0.80	0.004<	0.009	0.038	0.250	0.01 <W
860131	0.180	0.320	0.001<	0.20	0.001<W	0.004	0.037	0.240	0.01 <W
860204	0.071	0.170	0.001<W	0.46	0.001<W	0.001<	0.054	0.065	0.01 <W
860207	0.084	9.260	0.001	0.20	0.001	0.001	0.200	0.085	0.01 <W
860211	0.089	1.200	0.001<W	1.00	0.001<W	0.005	0.040	0.038	0.01 <W
860213	0.071	0.310	0.001<W	0.86	0.002	0.001	0.032	0.140	0.01 <W
860214	0.061	0.200	0.001	0.09	0.001<W	0.001	0.043	0.093	0.01 <W
860217	0.080	0.007	0.001	0.00<W	0.001	0.005	0.054	0.058	0.01 <W
860218	0.250	0.001<W	0.001	0.15	0.001	0.001<	0.078	0.085	0.01 <W
860220	0.590	0.001<W	0.001<W	1.28	0.001<W	0.001<	0.064	0.083	0.01 <W
860221	0.080	0.260	0.001<W	0.11	0.001<W	0.001<	0.034	0.031	0.01 <W
860226	1.100		0.001<W	2.00	0.002<	0.001<	0.220	0.900	0.01 <W
860227	0.058		0.001<W	0.09	0.002<	0.001<	0.004	0.012	0.01 <W
860301	0.130		0.001<W	0.50	0.002<	0.001<	0.130	0.100	0.01 <W
860307	0.340	0.538	0.001	0.12	0.002<	0.001<	0.032	0.250	0.01 <W
860308	0.150	0.460	0.002	1.00	0.002<	0.001<	0.043	0.130	0.01 <W
860310	0.190		0.001	0.88	0.002<	0.001<	0.038	0.238	0.01 <W
860311	0.061	0.440	0.001<W	0.03	0.002<	0.001<	0.047	0.054	0.01 <W
860317	0.240	4.530	0.001	0.68	0.003	0.001<	0.092	0.260	
860318	0.100	0.190	0.001	0.30	0.001	0.001<	0.024	0.031	
860319	0.280	0.900	0.001	0.80	0.002	0.001<	0.058	0.200	
860320	0.240	1.300	0.001<W	0.90	0.001	0.001<	0.065	0.120	
860321	0.190	2.020	0.001	0.90	0.001<W	0.001<	0.048	0.140	0.0002
860324	0.520	1.300	0.001	0.70	0.001	0.001<	0.061	0.390	
860325	0.830	1.400	0.001	1.70	0.001	0.001<	0.040	0.460	0.002
860327	0.580	0.920	0.001	0.40	0.001<W	0.001<	0.063	0.340	
860328	0.088	0.180	0.001	0.20	0.001<W	0.001<	0.056	0.041	0.0008
860402	0.120	0.810	0.001<W	0.10	0.001<W	0.001<	0.047	0.020	0.0000
860403	0.700	3.730	0.001	1.70	0.001<W	0.001<	0.064	0.160	
860404	0.170	0.500	0.001<W	0.80	0.001<W	0.001<	0.032	0.098	
860405	0.230	0.740	0.001<W	0.30	0.001	0.001<	0.033	0.072	
860407	0.120	0.210	0.001<W	0.70	0.001<W	0.001<	0.066	0.034	0.0001
860408	0.039	0.062	0.001<W	0.10	0.001<W	0.001<	0.045	0.004<	
860521	0.800	0.605	0.001	2.00	0.004<	0.004<	0.065	0.250	0.01
860522	0.060	0.804	0.001	0.29	0.004<	0.004<	0.070	0.110	0.00 <W
860523	0.040	2.147	0.001	0.29	0.004<	0.004<	0.065	0.059	0.00 <W
860526	0.101	1.853	0.001	0.60	0.004<	0.004<	0.076	0.220	0.01 <W
860527	0.171	2.095	0.001	0.29	0.004<	0.004<	0.035	0.340	0.01 <W
860528	0.161	3.731	0.001	0.29	0.004<	0.004<	0.097	0.340	0.01 <W
860529	0.171	4.457	0.001<W	0.29	0.004<	0.004<	0.065	0.310	0.01 <W
860530	0.249	1.841	0.001	0.29	0.004<	0.004<	0.055	0.380	0.01 <W
860609	0.206	1.447	0.001<W	0.29	0.004<	0.004<	0.042	0.130	0.01 <W
860610	0.652	1.112	0.001	1.70	0.004<	0.004<	0.087	0.490	0.01
MAXIMUM	1.100	4.457	0.002	2.00	0.003	0.011	0.220	0.900	0.01
ARITH MEAN	0.242	1.054<A	0.001<A	0.59<A	0.001<A	0.005	0.058	0.194	0.01 <A
GEOM MEAN	0.168	0.453<A					0.048		
MINIMUM	0.039	0.001	0.001	0.00	0.001	0.001	0.004	0.012	0.00
STD DEV (GEOM *)	0.235	1.156<A					0.039		
# SAMP IN STATISTICS	50	46	44	50	25	13	50	49	40
% SAMP (EXCLUDED)			12		50	74		2	

Legend:

Al = Aluminum
Ca = Calcium
Cd = Cadmium
Cl = Chloride
Co = Cobalt
Cr = Chromium
Cu = Copper
Fe = Iron
F = Fluoride

Units: ug/m^3

TABLE 2 (CONT'D) HI-VOL DATA FOR STATION NO. 48141 (INGHAM)

Date	Mg	Mn	Ni	NH_3	NO_3	Pb	PO_4	Si	SO_4	V	Zn
851220	0.041	0.004	0.005<	1.1	2.9	0.011	0.0<W	0.343	1.7	0.009<	0.023
860111	0.120	0.011	0.005<	0.6	1.5	0.005<	0.0<W	1.845	1.1	0.009<	0.015
860115	0.160	0.013	0.004	0.7	1.7	0.031	0.0<W	1.162	2.1	0.009<	0.038
860117	0.081	0.016	0.005<	4.0	9.2	0.031	0.1<W	1.018	5.7	0.009<	0.077
860119	0.047	0.005<	0.004	3.6	7.3	0.028	0.1<W	0.305	5.8	0.009<	0.041
860122	0.060	0.006	0.005<	1.8	2.9	0.160	0.0<W	0.431	3.9	0.009<	0.029
860124	0.150	0.008	0.005<	0.2	0.8	0.005<	0.0<W	0.949	1.0	0.009<	0.011
860127	0.270	0.007	0.005<	0.3	1.0	0.023	0.0<W	1.186	1.3	0.009<	0.019
860131	0.087	0.008	0.005<	1.1	3.2	0.008	0.0<W	1.331	2.0	0.009<	0.020
860204	0.001<W	0.002	0.001<W	0.1 <W	3.1	0.037	0.0<W	0.200	2.4	0.007	0.015
860207	0.001<W	0.005	0.022	0.1 <W	6.3	0.072	0.0<W	0.400	5.4	0.004	0.029
860211	0.001<W	0.001	0.001	0.1 <W	1.6	0.007	0.0<W	1.500	1.9	0.001<	0.006
860213	0.001<W	0.003	0.001<W	0.1 <W	2.8	0.025	0.0<W	0.400	2.9	0.001<	0.021
860214	0.001<W	0.005	0.001	0.1 <W	3.6	0.011	0.0<W	0.500	2.9	0.001<	0.027
860217	0.001<W	0.005	0.001<W	0.1 <W	2.9	0.019	0.0<W	0.200	7.8	0.001<	0.020
860218	0.001<W	0.007	0.003	0.1 <W	6.4	0.049	0.0<W	0.200	9.0	0.001	0.051
860220	0.001<W	0.005	0.004	0.1 <W	3.5	0.042	0.0<W	0.300	4.3	0.013	0.045
860221	0.001<W	0.002	0.001<W	0.1 <W	1.0	0.027	0.0<W	0.200	1.7	0.001<	0.013
860226	0.650	0.042	0.004	0.1 <W	1.2	0.048	0.1<W	4.700	1.8	0.001	0.036
860227	0.022	0.001	0.003<	0.1 <W	0.0<W	0.005<	0.0<W	0.200	0.0<W	0.001<	0.010
860301	0.270	0.005	0.003<	0.1 <W	2.1	0.013	0.0<W	0.500	1.0	0.001<	0.011
860307	0.096	0.007	0.003<	0.1 <W	0.4	0.014	0.0<W	1.000	0.7	0.001<	0.017
860308	0.130	0.006	0.003	0.1 <W	1.5	0.011	0.0<W	0.900	2.3	0.001	0.019
860310	0.073	0.014	0.005	0.1 <W	4.5	0.047	0.0<W	0.900	4.5	0.002	0.068
860311	0.046	0.003	0.003<	0.1 <W	1.3	0.013	0.0<W	0.500	3.1	0.001<	0.011
860317	0.240	0.016	0.002	0.179	2.3	0.045	0.1<W	1.300	5.3	0.001<	0.028
860318	0.027	0.004	0.001<W	0.226	2.6	0.008	0.1<W	0.400	4.9	0.001<	0.022
860319	0.097	0.012	0.002	0.491	6.7	0.038	0.1<W	0.900	9.0	0.001<	0.068
860320	0.150	0.007	0.001	0.044	0.5	0.011	0.1<W	0.700	2.3	0.011	0.012
860321	0.025	0.009	0.001<W	0.066	2.0	0.009	0.1<W	0.800	3.3	0.013	0.016
860324	0.230	0.013	0.001<W	0.069	0.9	0.029	0.1<W	1.800	2.1	0.016	0.025
860325	0.310	0.023	0.001<W	0.244	5.6	0.033	0.1<W	2.200	4.4	0.001<	0.054
860327	0.210	0.016	0.001<W	0.191	3.1	0.023	0.1<W	1.900	4.7	0.003	0.058
860328	0.021	0.003	0.001<W	0.163	1.3	0.019	0.1<W	0.300	2.4	0.001<	0.016
860402	0.036	0.001	0.001<W	0.004	0.0<W	0.009	0.1<W	0.200	0.6	0.001<	0.009
860403	0.001	0.009	0.001<W	0.032	0.6	0.023	0.1<W	0.900	1.1	0.001<	0.019
860404	0.057	0.012	0.001<W	0.035	2.0	0.018	0.1<W	0.600	1.8	0.001<	0.017
860405	0.056	0.008	0.001<W	0.016	0.9	0.021	0.1<W	0.600	0.7	0.001<	0.009
860407	0.044	0.003	0.001<W	0.123	2.0	0.015	0.1<W	0.400	3.3	0.001<	0.007
860408	0.010	0.001<W	0.001<W	0.046	0.0<W	0.016	0.1<W	0.100	1.1	0.015	0.005
860521	0.171	0.010	0.004<		2.9	0.040		0.600	3.5	0.080<	0.074
860522	0.033	0.008	0.004<		4.4	0.040		0.300	5.0	0.080<	0.026
860523	0.025	0.004<	0.004<		0.3	0.020		0.200	2.0	0.080<	0.007
860526	0.122	0.010	0.004<		1.5	0.030		0.700	1.7	0.080<	0.010
860527	0.243	0.020	0.004<		4.4	0.063		2.000	5.8	0.080<	0.068
860528	0.172	0.010	0.004<		2.9	0.040		1.200	8.7	0.080<	0.024
860529	0.248	0.010	0.004<		0.6	0.020		1.400	1.7	0.080<	0.019
860530	0.282	0.020	0.004<		1.2	0.020		2.000	1.5	0.080<	0.025
860609	0.068	0.005	0.004<		0.3	0.007		0.400	0.9	0.080<	0.020
860610	0.280	0.020	0.004<		4.1	0.040		2.300	2.9	0.080<	0.069
MAXIMUM	0.650	0.042	0.022	4.0	9.2	0.160	0.1	4.700	9.0	0.016	0.077
ARITH MEAN	0.109<A	0.009<A	0.002<A	0.4 <A	2.6<A	0.029	0.0<A	0.907	3.2<A	0.007	0.028
GEOM MEAN	0.037<A			0.1 <A				0.648			0.022
MINIMUM	0.001	0.001	0.001	0.004	0.3	0.007	0.0	0.100	0.0	0.001	0.005
STD DEV (GEOM *)	0.123<A			0.9 <A				0.815			0.020
# SAMP IN STATISTICS	50	48	29	40	50	47	40	50	50	12	50
% SAMP (EXCLUDED)		4	42			6				76	

Legend:
Mg=Magnesium
Mn=Manganese
Ni=Nickel
NH_3=Ammonium
NO_3=Nitrates
Pb=Lead
PO_4=Phosphates
Si=Silicone
SO_4=Sulphates
V=Vanadium
Zn=Zinc

Units: ug/m^3

TABLE 3 HI-VOL DATA FOR STATION NO. 48142 (CALDERARO)

Date	Al	Ca	Cd	Cl	Co	Cr	Cu	Fe	F
851220	0.100	0.210	0.001	0.50	0.004<	0.009	0.150	0.140	0.01 <W
860109	0.120	0.096	0.001<	0.06	0.004<	0.011	0.002<	0.120	0.01 <W
860115	0.100	0.450	0.001<	0.40	0.004<	0.004	0.025	0.150	0.01 <W
860117	0.150	0.210	0.001	0.50	0.004<	0.005	0.034	0.260	0.01 <W
860119	0.060	0.070	0.001<	0.10	0.004<	0.004	0.076	0.110	0.01 <W
860122	2.000	0.890	0.002	0.70	0.001<W	0.001	0.084	2.700	0.01 <W
860124	0.270	2.900	0.001<	0.30	0.001<W	0.001<	0.092	0.300	0.01 <W
860127	0.090	0.190	0.001<	0.00<W	0.001<W	0.001<	0.092	0.140	0.01 <W
860131	0.210	0.330	0.001<	0.20	0.001<W	0.002	0.100	0.280	0.01 <W
860204	0.045	0.100	0.001<W	0.34	0.001	0.001<	0.060	0.047	0.01 <W
860207	0.062	0.300	0.001	0.32	0.003	0.001<	0.048	0.058	0.01 <W
860211	0.071	1.000	0.001<W	1.20	0.001	0.001<	0.081	0.076	0.01 <W
860212	0.086	0.410	0.001<W	0.50	0.002	0.001<	0.090	0.076	0.01 <W
860213	0.059	0.180	0.001<W	0.00<W	0.001<W	0.001<	0.039	0.100	0.01 <W
860215	0.100	0.350	0.001	0.15	0.001<W	0.004	0.080	0.310	0.01 <W
860217	0.046	0.001<W	0.001	0.00<W	0.001	0.001	0.110	0.067	0.01 <W
860218	0.056	0.001<W	0.001	0.00<W	0.002	0.001<	0.110	0.140	0.01 <W
860220	0.019	0.001<W	0.001<W	0.06	0.002	0.001<	0.110	0.046	0.01 <W
860221	0.045	0.070	0.001<W	0.14	0.001<W	0.001<	0.074	0.045	0.01 <W
860225	0.064	1.800	0.001<W	0.40	0.002<	0.001<	0.036	0.085	0.01 <W
860226	0.190	6.300	0.001	1.20	0.002<	0.001<	0.100	0.260	0.01 <W
860227	0.140	3.700	0.001	0.44	0.002<	0.001<	0.046	0.170	0.01 <W
860228	0.035	0.880	0.001<W	0.41	0.002<	0.001<	0.052	0.053	0.01 <W
860307	1.800	2.400	0.001	1.00	0.002<	0.002	0.059	2.300	0.01 <W
860308	0.300	0.700	0.001	0.87	0.002<	0.001<	0.051	0.350	0.01 <W
860310	0.200	0.390	0.001	0.70	0.002<	0.001<	0.050	0.330	0.01 <W
860311	0.067	0.380	0.001<W	0.06	0.002<	0.001<	0.044	0.079	0.01 <W
860317	0.260	2.650	0.001	0.70	0.001	0.001<	0.170	0.320	
860318	0.760	0.690	0.001	0.10	0.001	0.001<	0.050	0.590	
860319	0.370	0.800	0.001	0.30	0.001<W	0.001<	0.130	0.280	
860320	0.540	1.900	0.001<W	0.60	0.001<W	0.001<	0.025	0.610	
860321	0.130	1.800	0.001<W	0.60	0.001<W	0.001<	0.045	0.130	
860324	0.220	1.500	0.001	0.23	0.001<W	0.001<	0.065	0.270	0.0006
860327	0.350	0.350	0.001	0.19	0.001<W	0.001<	0.071	0.330	0.0002
860328	0.350	1.800	0.001	0.23	0.001<W	0.001	0.048	0.440	0.0006
860402	0.022	0.600	0.001<W	0.32	0.001<W	0.001<	0.057	0.001<W	
860403	0.140	1.200	0.001<W	0.58	0.001<W	0.001<	0.055	0.036	
860404	0.110	0.790	0.001	0.26	0.001<W	0.001<	0.063	0.042	
860405	0.140	0.370	0.001	0.55	0.001<W	0.001<	0.046	0.057	0.0002
860407	0.040	0.300	0.001	0.35	0.001<W	0.001	0.100	0.018	0.0001
860408	0.016	0.096	0.001	0.00<W	0.001<W	0.001	0.043	0.004<	0.0001
860521	0.057	0.238	0.001	0.00<W	0.004<	0.004<	0.078	0.280	0.01 <W
860526	0.337	0.145	0.001	0.00<W	0.004<	0.004<	0.170	0.800	0.01 <W
860527	0.136	2.077	0.001<W	0.00<W	0.004<	0.004<	0.200	0.250	0.01 <W
860528	0.022	0.342	0.001<W	0.00<W	0.004<	0.004<	0.095	0.099	0.00 <W
860529	0.249	2.462	0.001	0.00<W	0.004<	0.004<	0.120	0.440	0.01 <W
860530	0.267	1.902	0.001<W	0.00<W	0.004<	0.004<	0.160	0.500	0.01 <W
860509	0.118	2.295	0.001<W	0.00<W	0.004<	0.004<	0.120	0.190	0.01 <W
860510	0.179	0.707	0.001<W	0.00<W	0.004<	0.004<	0.270	0.360	0.01 <W
MAXIMUM	2.000	6.300	0.002	1.20	0.003	0.011	0.270	2.700	0.01
ARITH MEAN	0.231	1.015<A	0.001<A	0.32<A	0.001<A	0.004	0.085	0.309<A	0.01 <A
GEOM MEAN	0.125	0.412<A							
MINIMUM	0.016	0.001	0.001	0.00	0.001	0.001	0.025	0.001	0.00
STD DEV (GEOM *)	0.378	1.191<A							
# SAMP IN STATISTICS	48	46	43	49	28	13	48	48	41
% SAMP (EXCLUDED)			12		42	73	2	2	

LEGEND:

Al = Aluminum
Ca = Calcium
Cd = Cadmium
Cl = Chloride
Co = Cobalt
Cr = Chromium
Cu = Copper
Fe = Iron
F = Fluoride

Units: ug/m^3

TABLE 3 (CONT'D) HI-VOL DATA FOR STATION NO. 48142 (CALDERARO)

Date	Mg	Mn	Ni	NH_3	NO_3	Pb	PO_4	Si	SO_4	V	Zn
851220	0.068	0.008	0.005<	2.2	5.8	0.077	0.1<W	0.457	3.3	0.009<	0.033
860109	0.043	0.005<	0.005<	0.1	0.0<W	0.005<	0.0<W	0.768	0.0<W	0.009<	0.004
860115	0.045	0.005	0.005<	0.3	0.0<W	0.005<	0.0<W	0.641	0.5	0.009<	0.005
860117	0.070	0.015	0.005<	3.7	8.5	0.031	0.1<W	1.087	5.4	0.009<	0.066
860119	0.031	0.008	0.005<	3.7	6.6	0.025	0.1<W	0.226	5.9	0.009<	0.045
860122	0.460	0.049	0.005<	0.2	0.8	0.008	0.0<W	11.510	1.5	0.009<	0.020
860124	0.210	0.011	0.005<	0.3	1.7	0.005<	0.0<W	1.336	2.1	0.009<	0.013
860127	0.047	0.004	0.005<	1.4	2.5	0.005<	0.0<W	0.473	3.4	0.009<	0.017
860131	0.099	0.012	0.005<	1.1	3.7	0.017	0.0<W	1.305	2.3	0.009<	0.021
860204	0.001<W	0.003	0.002	0.1 <W	3.0	0.019	0.0<W	0.200	2.3	0.004	0.009
860207	0.001<W	0.001<W	0.001<W	0.1 <W	1.0	0.008	0.0<W	0.200	1.0	0.001<	0.006
860211	0.001<W	0.006	0.002	0.1 <W	1.7	0.036	0.0<W	0.400	1.8	0.001<	0.011
860212	0.001<W	0.005	0.004	0.1 <W	1.8	0.051	0.0<W	0.400	3.1	0.001<	0.016
860213	0.001<W	0.005	0.001<W	0.1 <W	0.0<W	0.021	0.0<W	0.050	0.0<W	0.001<	0.020
860215	0.005	0.010	0.003	0.1 <W	5.9	0.043	0.0<W	0.800	5.2	0.001<	0.049
860217	0.001<W	0.005	0.005	0.1 <W	2.9	0.022	0.0<W	0.200	8.0	0.001<	0.025
860218	0.001<W	0.006	0.007	0.1 <W	3.8	0.068	0.0<W	0.200	7.3	0.006	0.051
860220	0.001<W	0.004	0.001<W	0.1 <W	2.6	0.036	0.0<W	0.200	4.5	0.008	0.018
860221	0.001<W	0.001	0.001<W	0.1 <W	1.1	0.021	0.0<W	0.200	1.8	0.003	0.009
860225	0.061	0.004	0.003<	0.1 <W	0.5	0.007	0.0<W	0.500	1.1	0.001<	0.006
860226	0.190	0.013	0.003	0.1 <W	1.3	0.012	0.0<W	1.300	1.6	0.001<	0.018
860227	0.140	0.008	0.003<	0.1 <W	0.6	0.005<	0.0<W	0.900	1.0	0.001<	0.009
860228	0.078	0.003	0.003<	0.1 <W	0.6	0.005<	0.0<W	0.400	6.4	0.001<	0.014
860307	0.610	0.048	0.005	0.1 <W	0.8	0.026	0.1<W	5.000	2.6	0.004	0.026
860308	0.190	0.011	0.006	0.1 <W	1.5	0.011	0.0<W	1.400	2.2	0.002	0.024
860310	0.100	0.018	0.003<	0.1 <W	4.8	0.041	0.1<W	0.900	5.1	0.002	0.089
860311	0.041	0.004	0.003<	0.1 <W	1.2	0.007	0.0<W	0.400	2.7	0.001<	0.021
860317	0.250	0.017	0.001	0.126	2.9	0.074	0.1<W	1.100	6.0	0.008	0.038
860318	0.140	0.012	0.001	0.223	2.4	0.018	0.1<W	3.200	6.1	0.028	0.031
860319	0.120	0.011	0.001<W	0.325	6.7	0.047	0.1<W	1.300	8.7	0.027	0.063
860320	0.270	0.013	0.002	0.026	0.5	0.007	0.1<W	2.800	2.4	0.010	0.009
860321	0.280	0.009	0.001<W	0.047	1.3	0.009	0.1<W	1.200	2.4	0.001<	0.017
860324	0.220	0.012	0.001	0.070	1.3	0.019	0.1<W	1.400	2.3	0.004	0.021
860327	0.210	0.017	0.001	0.141	2.1	0.029	0.1<W	2.000	5.8	0.004	0.047
860328	0.320	0.024	0.003	0.188	5.4	0.028	0.1<W	2.300	4.7	0.001<	0.059
860402	0.035	0.002	0.001<W	0.013	0.6	0.006	0.1<W	0.200	1.1	0.009	0.001<W
860403	0.059	0.006	0.001<W	0.038	0.8	0.009	0.1<W	0.600	1.1	0.003	0.007
860404	0.070	0.008	0.001	0.027	1.6	0.012	0.1<W	0.700	1.2	0.003	0.007
860405	0.067	0.013	0.001<W	0.048	1.7	0.011	0.1<W	0.500	1.7	0.001<	0.016
860407	0.052	0.003	0.001<W	0.091	2.2	0.011	0.1<W	0.500	4.2	0.001<	0.005
860408	0.032	0.001<W	0.001<W	0.038	0.0<W	0.008	0.1<W	0.100	1.8	0.006	0.004
860521	0.138	0.010	0.004<		2.6	0.040		0.500	2.9	0.080<	0.031
860526	0.316	0.030	0.005		5.5	0.090		2.400	6.7	0.080<	0.100
860527	0.120	0.010	0.004<		1.5	0.030		1.200	2.0	0.080<	0.010
860528	0.041	0.007	0.004<		2.9	0.040		0.200	4.4	0.080<	0.020
860529	0.342	0.020	0.004<		0.6	0.030		1.700	1.7	0.080<	0.010
860530	0.395	0.020	0.004<		1.5	0.030		2.300	2.9	0.080<	0.010
860609	0.081	0.006	0.004<		0.0<W	0.009		0.700	1.5	0.080<	0.005
860610	0.154	0.010	0.004<		1.5	0.030		1.100	1.5	0.080<	0.031
MAXIMUM	0.610	0.049	0.007	3.7	8.5	0.090	0.1	11.510	8.7	0.029	0.100
ARITH MEAN	0.127<A	0.011<A	0.002<A	0.4 <A	2.3<A	0.027	0.0<A	1.213	3.2<A	0.008	0.024<A
GEOM MEAN	0.045<A			0.1 <A				0.698			0.017<A
MINIMUM	0.001	0.001	0.001	0.013	0.0	0.006	0.0	0.050	0.0	0.002	0.001
STD DEV (GEOM #)	0.135<A			0.9 <A				1.774			0.022<A
# SAMP IN STATISTICS	49	48	28	41	49	43	41	49	49	17	49
# SAMP (EXCLUDED)		2	42			12				65	

Legend:

Mg=Magnesium
Mn=Manganese
Ni=Nickel
NH_3=Ammonium
NO_3=Nitrates
Pb=Lead
PO_4=Phosphates
Si=Silicon
SO_4=Sulphates
V=Vanadium
Zn=Zinc

Units: ug/m^3

TABLE 4
ARITHMETIC MEAN HI-VOL DATA (JAN.86-JUNE 86)

	PARAMETERS	48141 BROWN	48142 INGHAM	48142 CALDERARO
Al	Aluminum	0.839	0.242	0.231
Ca	Calcium	2.076	1.054	1.015
Cd	Cadmium	0.001	0.001	0.001
Cl	Chlorides	1.46	0.59	0.32
Co	Cobalt	0.001	0.001	0.001
Cr	Chromium	0.005	0.005	0.004
Cu	Copper	0.100	0.058	0.055
Fe	Iron	0.296	0.194	0.309
F	Fluorides	0.01	0.01	0.01
Mg	Magnesium	0.143	0.109	0.127
Mn	Manganese	0.015	0.009	0.011
Ni	Nickel	0.003	0.002	0.002
NH3	Ammonium	0.6	0.4	0.4
NO3	Nitrates	2.6	2.6	2.3
Pb	Lead	0.029	0.029	0.027
PO4	Phosphates	0.1	0.0	0.0
Si	Silicon	1.288	0.907	1.213
SO4	Sulphates	3.3	3.2	3.2
V	Vanadium	0.005	0.007	0.008
Zn	Zinc	0.060	0.028	0.024

TABLE 5
DUSTFALL AND FLUORIDATION DATA FOR STATION 48040(BROWN)

1986	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC
T.D.	2.9	3.2	3.9	5.5	6.5	2.4	3.0	2.5	3.4			
Al	.062	.055	.037	N.D.	.034	.016	.086	.053	.037			
Cd	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.			
Co	N.D.	N.D.	N.D.	N.D.	.003	N.D.	N.D.	N.D.	N.D.			
Cr	N.D.	N.D.	N.D.	N.D.	.001	N.D.	N.D.	.001	N.D.			
Cu	.003	.002	.001	N.D.	.004	.002	.004	.004	.003			
Fe	.021	.026	.024	.002	.021	.008	.026	.029	.019			
Mn	.001	.001	.001	N.D.	.001	.001	.001	.001	.001			
Mo	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	.001	N.D.			
Ni	N.D.	N.D.	N.D.	N.D.	.001	N.D.	.001	.001	N.D.			
Pb	N.D.	.003	.001	.001	.003	.001	.005	.002	.001			
V	N.D.	N.D.	.001	.001	N.D.	N.D.	N.D.	N.D.	N.D.			
Zn	.006	.006	.003	.008	.011	.004	.009	.008	.004			
F.R.	15	9	17	17	11	8	6	7	4			

LEGEND:
T.D. = Total Dustfall
Al = Aluminum
Cd = Cadmium
Co = Cobalt
Cr = Chromium
Cu = Copper
Fe = Iron
N.D. = Non-Detected
F.R. = Fluoridation Rate
Mn = Manganese
Mo = Molybdenum
Ni = Nickel
Pb = Lead
V = Vanadium
Zn = Zinc

UNITS:
Dustfall & Metals in Dustfall = gm/sq.m./30 days
Fluoridation Rate = ugF/100 sq.cm./30 days

TABLE 6
DUSTFALL AND FLUORIDATION DATA FOR STATION 48041(INGHAM)

1986	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC
T.D.	1.5	2.4	2.8	4.3	5.2	3.6	1.5	4.4	3.1			
Al	.042	.014	.018	.008	.022	.016	.065	.080	.041			
Cd	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.			
Co	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.			
Cr	N.D.	N.D.	N.D.	.001	N.D.	N.D.	N.D.	N.D.	N.D.			
Cu	.002	N.D.	.001	.001	.001	.001	.004	.005	.003			
Fe	.030	.022	.016	.003	.016	.010	.017	.035	.021			
Mn	.001	.001	.001	N.D.	.001	.001	.001	.001	.001			
Mo	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	.001	N.D.			
Ni	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	.001	N.D.			
Pb	N.D.	.002	.001	.004	.002	.001	.008	.002	N.D.			
V	N.D.	N.D.	.001	N.D.	N.D.	N.D.	N.D.	N.D.	.001			
Zn	.003	.003	.004	.008	.009	.003	.010	.011	.004			
F.R.	9	9	10	8	5	5	4	4	3			

LEGEND:

T.D. = Total Dustfall
Al = Aluminum
Cd = Cadmium
Co = Cobalt
Cr = Chromium
Cu = Copper
Fe = Iron
N.D. = Non-Detected
F.R. = Fluoridation Rate
Mn = Manganese
Mo = Molybdenum
Ni = Nickel
Pb = Lead
V = Vanadium
Zn = Zinc

UNITS:

Dustfall & Metals in Dustfall = gm/sq.m./30 days
Fluoridation Rate = ugF/100 sq.cm./30 days

TABLE 7
DUSTFALL AND FLUORIDATION DATA FOR STATION 48042(CALDERARO)

1986	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC
T.D.	1.7	1.2	1.5	4.9	5.1	1.3	2.5	2.4	5.6			
Al	.014	.009	.007	.004	.011	.005	.008	.008	.006			
Cd	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.			
Co	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.			
Cr	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.			
Cu	.001	.001	N.D.	.001	N.D.	N.D.	N.D.	.004	.001			
Fe	.017	.013	.009	.002	.013	.003	.010	.013	.006			
Mn	.001	N.D.	N.D.	N.D.	.001	N.D.	N.D.	.001	N.D.			
Mo	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.			
Ni	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	.001			
Pb	.001	.003	.002	.004	.006	N.D.	N.D.	.015	N.D.			
V	N.D.	N.D.	.001	N.D.	N.D.	N.D.	N.D.	.003	.001			
Zn	.002	.003	.003	.019	.002	.001	N.D.	.009	.002			
F.R.	19	13	15	12	10	23	9	13	7			

LEGEND:
T.D. = Total Dustfall
Al = Aluminum
Cd = Cadmium
Co = Cobalt
Cr = Chromium
Cu = Copper
Fe = Iron
N.D. = Non-Detected
F.R. = Fluoridation Rate
Mn = Manganese
Mo = Molybdenum
Ni = Nickel
Pb = Lead
V = Vanadium
Zn = Zinc

UNITS:
Dustfall & Metals in Dustfall = gm/sq.m./30 days
Fluoridation Rate = ugF/100 sq.cm./30 days